Spec. 45605

PROPOSAL

The undersigned hereby proposes to furnish and deliver **up to eight (8) Induced Draft Fan Medium Voltage Variable Frequency Drive Systems** to the Intermountain Power Service Corporation in accordance with **Specifications 45605**.

The undersigned agrees, upon the acceptance of this Proposal: (a) To execute IPSC's form of Contract (including the Contract Agreement and other Contract Documents identified in said Specifications) for furnishing and delivering the items and services embraced in the accepted Proposal; and (b) To perform its obligations under the Contract at the prices stated in the accompanying Proposal Schedule.

The undersigned furthermore agrees that, in case of failure to execute such Contract Agreement and provide the necessary check or Bidder's Bond accompanying this Proposal, and the monies payable thereon, shall be forfeited to and remain the property of Intermountain Power Agency.

The undersigned declares under penalty of perjury that this Proposal is genuine, is not a sham or collusive, and is not made in the interest or in behalf of any person or entity not herein named. The undersigned further declares under penalty of perjury that the bidder has not directly or indirectly induced or solicited any other bidder to submit a sham bid, or any other person, firm, or corporation to refrain from bidding. The undersigned also declares under penalty of perjury that the bidder has not in any manner sought by collusion to secure for itself an advantage over any other bidder.

I declare under penalty of perjury under the laws of the state of Utah that the foregoing is true and correct.

Date: Sept. 9, 2003

Bidder: Codale Electric Supply

Address: 362 South Commerce Loop
Orem Utah 84058

Signed By: Russell Terry
(Authorized Signature)

Print Name: Russell Terry

Title: Outside Sales

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Spec. 45605

PART C- DIVISION C2

BIDDING DOCUMENTS - PROPOSAL SCHEDULE

Proposal is hereby made to furnish and deliver to IPSC **up to eight (8) Induced Draft Fan Medium Voltage Variable Frequency Drive Systems**, F.O.B., IPP Plant Site, 850 West Brush Wellman Road, Delta, UT 84624, in accordance with **Specifications 45605**, the following:

Lump Sum Price For One (1) Complete Drive System For One (1) ID Fan Delivered In ~~January 2004~~ Estimate delivery Feb 13 - 2004. Released Sept 15, 2003	
Price in Words: Eight hundred thousand	Price in Dollars: $ 800,000.00 USF ✱ +
Lump Sum Price For Two (2) Complete Drive Systems For Two (2) ID Fans Delivered In January 2005	
Price in Words: One million, Six hundred thousand	Price in Dollars: $ 1,600,000.00 USF ✱ +
Lump Sum Price For Three (3) Complete Drive Systems For Three (3) ID Fans Delivered In January 2006	
Price in Words: Two million, Four hundred thousand	Price in Dollars: $ 2,400,000.00 USF ✱ +
Lump Sum Price For Two (2) Complete Drive Systems For Two (2) ID Fans Delivered In January 2007	
Price in Words: One million, Seven hundred thousand	Price in Dollars: $ 1,700,000.00 USF ✱ +
Latest Date for IPSC To Exercise Option To Purchase Two (2) Complete Drive Systems In January 2005	
Date: April 2004	
Latest Date For IPSC To Exercise Option To Purchase Three (3) Complete Drive Systems In January 2006	
Date: April 2005	
Latest Date For IPSC To Exercise Option To Purchase Two (2) Complete Drive Systems in January 2007	
Date: April 2006	

****Note: Bids shall include an anticipated payment schedule.**

✱ Optional Pricing, Dual channel drive system equipped with N-1 Inverter Power device redundancy adder $97,500.00 ea USF

+ See attached

DIVISION C2 PROPOSAL SCHEDULE

Contractor's Technical Services: The following adjuring prices will be used to adjust the Contract amount for manufacturer's service representatives time:

	Daily Rate	Daily Overtime Rate
Per Diem at the IPP Job Site:		$250.00/hr.
Per Round Trip to and from the IPP Job Site:		

See attached

Prices: The price or prices shall be firm.

Cash Terms: A discount for prompt payment is offered of 0% percent for Contract payments made within 30 calendar days after date of acceptance or delivery and receipt of invoice.

Taxes: The foregoing quoted prices are exclusive of all applicable sales and use taxes.

Manufacturer: Allen Bradley, Rockwell Automation

Location of Point of Manufacture: Cambridge ON. Canada

Brand and Catalog Number or Other Designation: AllenBradly Power Flex 7000

Form of Business Organization: The bidder shall state below the form of its business organization.

Bidder is: Corporation, organized under the laws of the state of Utah.
(Corporation, Partnership, Limited Partnership, Individual)

If a partnership, the bidder shall state below the names of the partners. If a corporation, the bidder shall state below the names of the president and of the secretary.

Dale Holt Jay R Holt

Person to Contact: Should IPSC desire information concerning this Proposal, please contact:

Name: Russell Terry Telephone No: 801-724-3000

Address: 362 South Commerce Loop, Orem Ut. 84058

(If different, the address of bidder's chief executive office is:) 3150 South 900 West Salt Lake City Ut. 84119 801-975-7300

PART C - DIVISION C3

BIDDING DOCUMENTS - ADDITIONAL BID INFORMATION

1. Detailed Information: The bidder shall submit complete and definitive information on its offering in sufficient detail to permit a complete analysis of the Proposal. The requirements stated in the Instructions to Bidders, relative to information submittal, shall be followed.

   The requirements for information contained in this Division are basic requirements. Additional information shall be provided as requested by IPSC.

   The blank data sheets included in this Division shall be completely filled in. The data listed therein shall not relieve Contractor of its responsibility for meeting the requirements of the Detailed Specifications.

   The bidder shall not alter the original Proposal Data Division page numbers. If it becomes necessary to add pages, other than the end of the Division, a suffix such as a, b, c, etc., shall be added to the original number to designate the added page number. Pages added at the end of the Division shall be numbered sequentially by continuation of originally established numbering.

   Where alternates are indicated in the Proposal or Proposal Data, the bidder shall provide complete information for each alternate.

2. Drawings: Drawings shall be submitted with the Proposal in sufficient detail to permit evaluation of the equipment offered and to permit preliminary arrangement studies to be made.

   A plan view drawing showing the proposed equipment in the existing electrical equipment room shall be submitted. Contractor shall also include estimated weights for all equipment. Outdoor cooling equipment, if required, shall also be shown. External interconnection one-line diagram showing all power, control, and protection cabling required to complete the installation of the VFD systems.

3. Supplementary Information: The following supplementary information shall be submitted with the Proposal:

Supplementary Information
Complete Description of Proposed VFD. This Shall Include a Description of Shipping Components and Field Assembly Installation.
Summary Description of Codes and Standards Used If Different than Specified, Including a Review of Major Differences.

Supplementary Information
Identification of Any Modifications Required to IPSC's ID Fan System, Composed of ID Fan Motor, ID Fan, Connecting Shaft, Bearings, and Cable Connecting the ID Fan Motor to the VFD System to Allow this Equipment to Operate with the VFD While Maintaining a Normal Thirty (30) Year Lifetime of the ID Fan System.
Documentation Indicating Contractor's VFD System Does Not Produce Torsional Vibrations, Shaft Torsional Resonance, or Torque Pulsations Within the Connecting Shaft of the ID Fan System.
Documentation Indicating Contractor's VFD System Will Not Create Accelerated ID Fan System Bearing Wear Due to Common Mode Voltages Delivered by High Frequency PWM or Other Signals from Contractor's Inverter Drive.
Documentation Indicating Contractor's VFD System Does Not Contribute to Insulation Breakdown of the End Turns of the Motor Winding.
Names and Other Contact Information of Five (5) Purchasers of the Proposed VFD System Applied to Motors of 3,000 Horsepower (HP) and Above Who Have Had the Equipment Installed and Operating for at Least Two (2) Years.
Priced Preliminary Spare Parts List.
Input Current Including Harmonic Content at 25, 50, 75, 85, and 100 Percent Load.
Composite Data on Mean Time to Failure and Mean Time to Repair for Typical Components Contained Within the VFD System and Shown by Operating Experience to Fail or Require Replacement.
Detailed Description of the Installation Instructions of the Proposed Drive System Including All of Its Components and Any Modifications to Existing Equipment.
Description of the Failure Mode If Control Power Is Lost to the VFD Control System.
Description of VFD Operation When the Input Voltage Dips to 70 Percent.
Description of the Failure Modes of the Power Switching Devices (SCR, GTO, Diode, IGBT, IGCT, etc.), or Switching Device Control That Will Allow the Drive System to Continue to Operate Without Tripping the Fan.
Description of Accelerating and Decelerating Torque Programming Capabilities and Other Pertinent Capabilities and Limitations.
Preliminary Schedule.

Supplementary Information
Harmonic Calculation.
Efficiency (At the Input to VFD Isolation Transformer) Graph with Y-Axis Indicating 25, 50, 75, 85, and 100 Percent Torque and X-Axis Indicating 25, 50, 75, 85, and 100 Percent Frequency.
Catalog Brochures.
Complete List of Required Maintenance Tools as Discussed in Division F3, Article 15, General Equipment Specifications. The Listing Shall Include a Complete Description and Quantity of Each Item.
Information Specified in Division B1, Instructions to Bidders.
Equipment Storage Requirements, Including Inside or Outside Requirements and Requirements for Controlled Temperature or Humidity, etc.
Description of Manufacturing, Testing, and Inspection Procedures.
Written Description, Logic Diagrams, or Ladder Diagram Indicating Recommended Operating Sequence.
Maintenance Activities Required by the Manufacturer And/or by Contractor to Provide Adequate Storage and to Maintain Valid Material and Equipment Warranties.
Motor Information If Motor Is Furnished from Division F9, Medium Voltage Induction Motors.
Transformer Information Division F8, VFD Isolation (VFDI) Transformers

4. Equipment and Material Data: Please provide the following equipment and material data to assist IPSC in evaluating the Technical Proposal:

Equipment and Material Data
Complete Description of the Proposed System Indicating Exactly What Is Being Replaced and What Is Being Reused.
A Drawing (the Plant Arrangement - AQCS Control Building Mezzanine Drawing May Be Marked up to Show Equipment Layout) Showing the Proposed Arrangement and Dimensions Including Clearances Between Existing Items and All New Items. This Drawing Shall Also Indicate the Approximate Weight of All Components and Any New Wall or Floor Penetrations.

Equipment and Material Data
Guaranteed Reliability and Maintainability Times of the Proposed System.
Description of the Work Required for Complete Replacement.
A List of Maintenance Tools, Which Shall Be Furnished with the Equipment.
A Description of the Manufacturer's Standard Factory Test Procedure.
Expected and Maximum Heat Loss on a per Drive Basis.
A List of at Least Three (3) Sites and Names of Individuals That May Be Contacted Where Similar Equipment Has Been Retrofitted.
If a New Motor Is Being Provided, Verify That the Minimum Speed of 10 Percent Is Acceptable to the Motor Vendor.
Since the VFD Shall Be Suitable for Continuous Operation at Turning Gear Speed for Equipment Cool-down, Provide Information Describing the Operation at Turning Gear Speed.
Harmonic Analysis, Which Includes All Voltage and Current Harmonics up to the 49^{th}.
Any Alternate Access Options Required.
Heat Dissipation Data Necessary to Verify Existing HVAC System or Design a New HVAC System.
A Summary Description of Codes and Standards Used If Different than Specified Including a Review of Major Differences.
A Price List of Recommended Spare Parts.
A List of Any Special and Maintenance Tools Being Furnished.
Bidder's Experience Record with Proposed Equipment.
A List of Factory Routine Tests Being Proposed.
A Complete Description of the Extent of Shop Assembly of Components, and What Will Not Be Shop Assembled.
Efficiency Versus Load Curves Based on the Driven Equipment.

Equipment and Material Data
A Written Description of the Results of a Failure of Any Power Switching Device (SCR, GTO, Diode, IGBT, IGCT, etc.), or Switching Device Control. Contractor Shall Include the Sequence of Each Channel in the Write-up.
A Description of Why Rear or Side Access Is Needed.
Contractor Shall Confirm That All Power Components in the Converter Sections Will Be Mounted on a Swing Frame or Rack-out for Ease of Maintenance. If Not, Contractor Shall Describe Proposed Mounting Method.

Variable Frequency Drive System	
VFD Isolation Transformer Rating (kVA):	See attached
System Input Voltage:	
System Output Voltage:	
Rated Drive Output Power (Continuous kVA):	
Rated Drive Output Current (Continuous A):	
Nominal Load Power (HP):	
Rated VFD Input Current (A):	
Nominal VFD Input Current at 8,200 HP Output (A):	
Variable Frequency Drive	
Manufacturer and Model:	See attached
Overall Dimensions:	
Height (Inches):	
Depth (Inches):	
Width (Inches):	
Shipping Height (Inches):	
Length of Longest Shipping Piece (Inches):	
Technology:	
Microprocessor-Based Multi-Level Switching:	
Phase/Frequency/Voltage (ph/Hz/V):	
Rectifier Device:	
Inverter Device:	
Cell Voltage (V):	
Number of Cells:	

Variable Frequency Drive	
In the Event of Any Power Switching Device (SCR, GTO, Diode, IGBT, IGCT, etc.), Failure, Will the VFD Continue to Operate at Full Rated Output?	See Attached Yes _____ No _____
If "No", Explain:	
Number of Pulses:	
DC Link Capacitors:	Yes _____ No _____
Input Power Factor (30 to 100 Percent Speed) (Cos f):	
Power Interrupt Ride-Through Duration (Cycles):	
Voltage Dip (With Continuous Operation) (Percent):	
VFD Output Voltage (V):	
Overload Capability for Sixty (60) Seconds (Percent):	
Torque Pulsations Across Speed Range (Percent):	
Cooling Medium:	
Enclosure Protection:	
Ambient Temperature Maximum (°C):	
Humidity (Non-Condensing) (Percent):	
Altitude (Feet):	

DC Link Reactor Data	
Manufacturer:	See attached
Class and Type of Core:	
Insulating Liquid:	
Quantity:	
Nominal DC Voltage Rating (V):	
Continuous DC Current Rating (V):	
Rated DC Load (kW):	
Conductor Material of Winding (If Aluminum, State Grade):	
Basic Lighting Impulse Insulation Level (BIL) (kV):	
Approximate Resistance at 75°C (OHM):	
Inductance (Henrys) (H):	
Loses (Guaranteed):	
No-Load Loss (Excitation Only):	
At 100 Percent Voltage (kW):	
At 110 Percent Voltage (kW):	
Total Loss, No-Load Loss Plus Load Loss, With Full Rated DC Load (kW):	
Temperature Under Continuous Operation Guaranteed:	
Temperature Rise at Full Rated DC Load:	
Winding Temperature Rise by Resistance (°C):	
Hottest Spot Winding Temperature Rise (°C):	
Average Sound Level at Rated DC Load, Scale "A", Slow Response, at One (1) Foot from Reactor (DC):	

DC Link Reactor Data	
Short Circuit Capability:	See Attached
DC Short Circuit Current (A):	
Maximum Duration of Short Circuit Current (Seconds):	
Weight and Dimensions:	
Net Weights:	
Core and Coils (Pound):	
Insulating Liquid (Pound/Gallon):	
Total (Pounds):	
Heaviest Piece to Handle During Erection (Pounds):	
Overall Dimensions:	
Height (Inches):	
Depth (Inches):	
Width (Inches):	
Shipping Height (Inches):	
Tuned Filter Bank	
Is a Tuned Filter Bank Required for Harmonic Suppression:	Yes _____ No _____
If "Yes", Where Is it Mounted? (Include Dimensions and Weights):	
Drive Cooling System	
Manufacturer:	
Cooling Methodology (Liquid/Air):	
Type of Liquid:	
Is Cooling System 100 Percent Redundant:	Yes _____ No _____
Net Weight (Pounds):	

Harmonic Voltage Distortion			
Guaranteed Maximum Harmonic Voltage Distortion Contribution, Without Filters, to Auxiliary Electrical Power System Under the Worst Case Conditions:			
Harmonic	**90 Percent**	**100 Percent**	**110 Percent**
5			*
7			*
11			*
13			*
17			*
19			*
23			*
25			*
Total:			*

Efficiency	
Guaranteed Overall System Efficiency at Rated Speed and Load (Percent):	*
Total Guaranteed System Losses at Rated Speed and Load (kW):	*
System Speed Response	
Maximum Deceleration Rate (Rpm/Sec):	*
Maximum Acceleration Rate (Rpm/Sec):	*
Interface	
Type and Quantity of Communication Ports Which Are Included, (i.e., RS232, RS485, USB):	*

* See attached